



FAC variety observed by Cluster, Champ and Swarm

Junying Yang (1,3), Malcolm Dunlop (1,2), Yanyan Yang (4), Chao Xiong (5), Hermann Lühr (5), Yulia Bogdanova (2), Qinghe Zhang (7), Jinbin Cao (1), Liuyuan Li (1), Yuduan Ma (1), Wenlong Liu (1), Huishan Fu (1), Xinhua Wei (4), Haoyu Lyu (1), Tieyan Wang (1), Chao Shen (4), Nils Olsen (6), and Patricia Ritter (5)

(1) Space Science Institute, School of Astronautics, Beihang University, 100191, Beijing, China, (2) RAL, Chilton, Oxfordshire, OX11 0QX, UK, (3) Key Laboratory of Earth and Planetary Physics, Chinese Academy of Sciences, (4) NSSC, CAS, PO Box 8701, Beijing 100190, China, (5) GFZ, Telegrafenberg, Potsdam, 14473, Germany, (6) DTU Space, Electrovæj, Bldg 327, DK-2800 Kgs. Lyngby, Denmark, (7) CSW, Institute of Space Sciences, Shandong University, Weihai, 264209, China

Both large- and small-scale field-aligned currents (FAC) have been observed in the auroral zone. Small-scale systems are often observed with latitudinal thicknesses of several tens of kilometers. As to large-scale systems, these can extend over several degrees of magnetic latitude, and can be described in terms of R1 and R2 FAC systems. A detailed analysis of phenomenon in the auroral area has been done, using Cluster four satellites constellation, one low orbit satellite Champ and examples from the three satellites of Swarm. In particular, we focus on coordinated events between Cluster and Champ in order to classify the FAC signatures seen at both medium and low orbit. The FAC system exhibits both long and short term periodic variety. There is a good correspondence of FACs observed by high altitude Cluster constellation and the low altitude Champ and Swarm satellites. These signatures also associate with ground magnetic field data. Further work will investigate the relationship of FACs with sub-storm occurrence and changes in the IMF.